

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
17 July 2003 (17.07.2003)

PCT

(10) International Publication Number  
**WO 03/056936 A3**

(51) International Patent Classification<sup>7</sup>: **A23K 1/18**,  
A23L 1/325, C09H 3/00

(21) International Application Number: PCT/NO03/00002

(22) International Filing Date: 7 January 2003 (07.01.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
20020047 7 January 2002 (07.01.2002) NO

(71) Applicant (*for all designated States except US*): **NORWEGIAN INSTITUTE OF FISHERIES AND AQUACULTURE RESEARCH AS** [NO/NO]; Department SSF, Kjerreidviken 16, N-5141 Fyllingsdalen (NO).

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): **AKSNES, Anders** [NO/NO]; Boenesstoelen 6, N-5152 Bergen (NO).

(74) Agent: **AS BERGEN PATENTKONTOR**; Postboks 1998 Nordnes, N-5817 Bergen (NO).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

— with international search report

(88) Date of publication of the international search report:  
16 October 2003

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: PROCESSES FOR IMPROVING BINDING CAPABILITY AND BIOLOGICAL DIGESTABILITY

(57) Abstract: The present invention describes processes for obtaining a fish product with improved binding capabilities. Gelatine is liberated from collagen in connective tissues, skin and bones that is naturally present in the fish raw material as the product is produced from. Further, the present application describes processes for improving the digestibility of bone bounded minerals in feeds. The result is improved biological digestibility of calcium and phosphorus.



WO 03/056936 A3

## INTERNATIONAL SEARCH REPORT

International Application No.

PCT/NO 03/00002

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A23K1/18 A23L1/325 C09H3/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A23K A23L C09H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
|------------|--|-----------------------|
| X          | US 5 093 474 A (GROSSMAN SHLOMO ET AL)<br>3 March 1992 (1992-03-03)<br>the whole document<br>---   | 1-30                  |
| X          | US 5 484 888 A (HOLZER DAVID)<br>16 January 1996 (1996-01-16)<br>the whole document<br>---   | 1-30                  |
| X          | WO 99 33924 A (SCOTT ROBERT ;HE XIONGWEI<br>(FR); CADE DOMINIQUE (FR); WARNER LAMBER)<br>8 July 1999 (1999-07-08)<br>the whole document<br>--- | 1-30                  |
| X          | DE 200 21 273 U (KLOPFER GERT)<br>2 August 2001 (2001-08-02)<br>the whole document<br>---<br>-/--  | 1                     |

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&amp;" document member of the same patent family

Date of the actual completion of the international search

12 May 2003

Date of mailing of the international search report

03 JUN 2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

DAGMAR JÄRVMAN / ELY

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
|------------|--|-----------------------|
| X          | <p>"Was tut der Fisch im Gummibär?"<br/> ZFL,<br/> vol. 50, no. 1/2, 1999, page 3,18-19<br/> XP002240702<br/> the whole document</p>   | 1-30                  |
| X          | <p>CHIE SHIMOSAKA ET AL: "Changes in the<br/> Physical Properties and Composition of<br/> Fish Bone Cured in an Acetic Acid<br/> Solution"<br/> J. HOME ECON. JPN.,<br/> vol. 49, no. 8, 1998, pages 873-879,<br/> XP002240703<br/> the whole document</p>   | 1-30                  |
| X          | <p>MONTERO P ET AL: "Gelification of<br/> collagenous material from muscle and skin<br/> of hake (Merluccius merluccius L.) and<br/> trout (Salmo irideus Gibb) according to<br/> variation in pH and the presence of NaCl<br/> in the medium"<br/> ZEITSCHRIFT FUER LEBENSMITTEL-UNTERSUCHUNG<br/> UND -FORSCHUNG,<br/> vol. 191, no. 1, 1990, pages 11-15,<br/> XP002240704<br/> ISSN: 0044-3026<br/> the whole document</p> | 1-30                  |
| X          | <p>US 5 853 791 A (ROUSSEL HERVE)<br/> 29 December 1998 (1998-12-29)<br/> the whole document</p>   | 1-30                  |
| X          | <p>MONTERO P ET AL: "Extracting conditions<br/> for megrim (Lepidorhombus boscii) skin<br/> collagen affect functional properties of<br/> the resulting gelatin."<br/> JOURNAL OF FOOD SCIENCE,<br/> vol. 65, no. 3, April 2000 (2000-04),<br/> pages 434-438, XP002240705<br/> ISSN: 0022-1147<br/> the whole document</p>  | 1-30                  |

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/NO 03/00002

## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 1,16,23 and 27  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:  
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 1,16,23 and 27

The wording of claims 1, 16, 23 and 27, which indicate a general process or a product for improving the binding capability of a fish material, does not clearly define one solution of one technical problem. Thus, with the present wording, these claims do not mention any specific measures.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-15, partly of claims 23-26 and claims 27-30

Claims 1-15, partly of claims 23-26 and claims 27-30  
directed to a process for improving the binding capability  
of a fish material and to a product obtained by the process

2. Claims: 16-22, partly of claims 23-26 and claims 27-30

Claims 16-22, partly of claims 23-26 and claims 27-30  
directed to a process for improving the biological  
digestibility of a feed product and to a product obtained  
by the process.

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International Application No  
**PCT/NO 03/00002**

| Patent document<br>cited in search report |   | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|---|---|---------------------|----------------------------|---------------------|
| US 5093474                                | A | 03-03-1992          | IL 87344 A                 | 29-03-1992          |
| US 5484888                                | A | 16-01-1996          | NONE                       |                     |
| WO 9933924                                | A | 08-07-1999          | AU 1380199 A               | 19-07-1999          |
|   |   |                     | CA 2303852 A1              | 08-07-1999          |
|   |   |                     | CN 1279701 T               | 10-01-2001          |
|   |   |                     | EP 1042405 A1              | 11-10-2000          |
|   |   |                     | WO 9933924 A1              | 08-07-1999          |
| DE 20021273                               | U | 02-08-2001          | DE 20021273 U1             | 02-08-2001          |
| US 5853791                                | A | 29-12-1998          | FR 2751847 A1              | 06-02-1998          |
|   |   |                     | AT 207306 T                | 15-11-2001          |
|   |   |                     | AU 3944297 A               | 25-02-1998          |
|   |   |                     | CA 2262841 A1              | 12-02-1998          |
|   |   |                     | DE 69707697 D1             | 29-11-2001          |
|   |   |                     | DK 924992 T3               | 18-02-2002          |
|   |   |                     | EP 0924992 A1              | 30-06-1999          |
|   |   |                     | ES 2166557 T3              | 16-04-2002          |
|   |   |                     | WO 9805217 A2              | 12-02-1998          |
|   |   |                     | PT 924992 T                | 29-04-2002          |